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A ROMAN CITY IN THE CHEVIOTS.

SOME thirty-five miles north-west of Newcastle-on-Tyne, in the very heart of the Cheviot Hills, the observant traveller comes upon some interesting ruins. These consist of fragments of walls, built of large blocks of hewn freestone beautifully finished and jointed together, and rising in some places to a height of eight or nine feet, but even this evidently much short of their original height. If you trace these walls from point to point, they will be found to enclose a great space of ground, nearly square, measuring 475 feet in length from north to south, and 440 feet from east to west, and with a gateway entering from each of the four sides. These walls, moreover, are of immense thickness, the exterior face being of ashlar work, and the interior of rubble. Even in their present ruined and fragmentary condition, they suggest a place of enormous strength, intended for the secure and permanent protection of its inhabitants. And when the visitor reaches the gateway in the western wall, he will find it standing intact up to the spring-stone of the arch on either side; and at his feet he will see two parallel grooves worn in the stone pavement of the entrance, marking where wheeled vehicles had passed in and out. These grooves were not made during any recent time; for in the middle of the gateway is a square block of stone against which the gates of the fortress shut, and which stone would effectually bar the way of our modern vehicles. How, then, were these grooves hollowed out, and when? They were worn out by the high wheels of the double-horsed Roman chariots, the horses being so harnessed that they could separate and pass one on each side of that stone block in the centre; and these grooves are the record of their many exits and entries. The ruins around us are indeed the remains of a Roman station, the ancient City of Brementium, built when our era was little more than a century old.

It is strange to stand here amid these gray

mountain solitudes and look upon those traces of a life that has long since died out. What long centuries have come and gone since the Roman here set up his altar and offered sacrifice to his gods, and yet how near to him does the sight of these worn grooves bring us! They seem as if made but yesterday, and half suggest that the sound of his chariot wheels cannot have more than passed out of hearing. Yet it is eighteen hundred years since Agricola and his legions subdued the fierce Brigantes to whom these hills and valleys then belonged, and nearly fifteen centuries since Honorius recalled the Roman armies from Britain and left our island once more a prey to other and more enduring invaders. And one has only to look around to realise this. The ground inside the walls of the camp is not only the site of modern farmhouses and offices, but it has on it also the ruins of two old Border keeps. For the immense fortifications which the Romans here erected have for hundreds of years served but as quarries for the people in the neighbourhood. At the very time of our visit, a few masons were engaged in building an additional cottage within the camp, and were for this purpose digging materials out of one corner of the wall. It is well that the grooved stones in this ancient pavement of the western gateway have hitherto been left undisturbed.

Every dweller in London knows the name of Watling Street. This long Roman causeway ran from Dover to Chester, approaching London from the south by way of Blackheath, crossing the Thames near Westminster, and running north-west in the line of what is now Edgware Road. But this was not the only Watling Street which the Romans constructed in Britain. There was, among others, one that came north through the counties of York and Durham and Northumberland, passing up the vale of Rede Water across the Cheviots into Scotland, in which country it terminated as far north as Stirling. This famous Roman road is still to be seen and traced for miles in many places,

but in few is it more distinctly marked than where it runs northward up the Rede Valley past Otterburn and on to the Camp of Bremenium, near High Rochester.

Within the last half-century the greater portion of the interior of the camp has been investigated and explored, and the plan of it as thus laid bare will be found in the third edition of Dr Collingwood Bruce's learned work, *The Roman Wall*. In consequence of these investigations, he says, 'we are provided with the ground-plan of a Roman station more complete than any we previously possessed.' But, unfortunately, after these expensive and laborious excavations had been made, the whole of the vast mass of debris had to be replaced, and the ground levelled up as before. And why? Because 'the neighbouring proprietors had the right of pasturage over the station'! Four and a half acres of hill-pasture worth perhaps five shillings an acre of yearly rent! Why had not Government the power to step in in such a case and compensate the proprietors, so that the stone foundations of the ancient Roman houses, baths, hypocausts, and temples, and all that was left of the camp, might have remained exposed to view? The streets were found to be still paved with flags, but these cannot now be trod by the feet of pilgrim or antiquary, of so much more immediate value to the kingdom was the grazing-ground of a few score of sheep.

From the relics of the Roman occupation that were found in the camp in the course of the excavations, the period at which it was first built can with some degree of accuracy be ascertained. Reference has already been made to the conquest of Agricola, who took command of the Imperial troops in Britain in 78 A.D. The nation of the Brigantes, who held all the country between the Humber and the Forth, had presented a stubborn front to the invaders, and it was only after repeated campaigns that Agricola subdued them. At the end of seven years he was recalled to Rome; but before his recall, he had, in order to secure the southern half of Britain against the inroads of the northern or Caledonian tribes, established a chain of forts across the island between the Tyne at Newcastle and the Solway at Carlisle. This line of forts was in 120 A.D. superseded by the great stone wall of the Emperor Hadrian, the remains of which, with its numerous supporting stations and outworks, are still abundant, and have formed the basis of much antiquarian study. But the erection of this wall did not quell the turbulent northern barbarians, and in 138 A.D. Hadrian's successor, Antoninus Pius, sent Lollius Urbicus as his legate to Britain, who, after a long war, succeeded in driving the Caledonians to the north of the Forth and Clyde, between the estuaries of which two rivers he raised a strong wall of turf, supported by forts at regular intervals. It was probably about this time that the northern portion of Watling Street causeway was constructed, in order to improve the means of communication between the Northern and the Southern Walls; and about this time also that the foundations of the station at Bremenium were laid. For an inscription has been found in the station which stated that the first cohort of the Lingones erected this building in honour

of the Emperor Antoninus Pius, under the direction of the Imperial legate, Quintus Lollius Urbicus—thus fixing the date between 138 and 140 A.D., the years during which Lollius Urbicus was in Britain.

But so strong and extensive a piece of mason-work as this station with its great walls and numerous other buildings must have been, was probably the work of more than one year. Its site has been well chosen for defence. It stands on a kind of plateau, from which on the south side the ground sinks rapidly down to the Rede, and on the west to the bed of a small tributary stream. On the east side it is passed by the Watling Street, and beyond this was anciently protected by a marsh. A high earthen rampart, with its corresponding moat, invested it on every side; but on the north and east sides, which were most vulnerable to attack, there are three lines of earthen ramparts. Inside of all these ramparts was the huge stone wall, from fourteen to sixteen feet in height. The general thickness of the wall is about seventeen feet, but there are two places where this thickness is exceeded, chiefly on the west side, where for a length of 130 feet the wall has had a thickness of twenty-eight feet. This immense thickness is pierced by the western gateway with its grooved pavement, and the wall at this place is believed to have been built thus broadly and solidly in order to serve the purpose of a 'ballistarium'—that is, the part of the fortifications on which were placed the ballistæ or military engines that were used for hurling stones and other heavy missiles against the enemy. Two inscriptions still exist, the one recording the erection, the other the restoration, of a ballistarium.

As to the interior arrangement of the city, there had originally been, as was usual in Roman stations, two main streets—one running between the northern and the southern gate, the other between the gates on the east and west. The result of the excavations showed, however, that the existing buildings were not the work of one period, but of two, if not three. In consequence of these later changes—probably made by the Romanised Britons after the Imperial troops had evacuated the country—the street running north and south had been interfered with and built over by later erections. That from east to west, on the contrary, was traceable, as were also two other parallel streets. On more than one occasion, in the opinion of Dr Bruce, the city had been visited by devastation; and each reconstruction had been inferior to the former in the style of building, and appeared to have been performed in a hasty manner.

'The first thing,' says Dr Bruce, 'that struck a stranger on entering the station whilst the excavations were going forward was the extreme economy of space which was exercised. Every part of the area that was explored had been covered with buildings. These, for the most part, were small and crowded together. The main streets varied in width from ten feet to fourteen feet. The subsidiary ways leading to the several habitations were usually less than three feet wide. Generally speaking, the streets of earlier formation were flagged with broad flat stones; those of later were paved with small

stones. The houses were strongly built, consisting of stone walls of from two to four feet thick. They had been roofed with sandstone slate. It is probable that windows were very sparingly used, very little window glass having been found around the ruins. . . . The drainage of the city seems to have been very complete. Conduits were provided for introducing fresh water, as well as sewers for taking off the rain and refuse water. . . . One of the first things which a garrison drawn from southern Europe would demand would be warmth; accordingly, we find that several buildings were provided with hypocausts,* for diffusing a comfortable temperature through them. This was particularly the case in the long ranges of barracks on each side of the central building. Yet all these streets and alleys of this old Roman city in the Cheviots, with the various appliances for sanitary and hygienic requirements, are once more buried beneath the soil.

The completed city, with its great walls and flanking palisaded ramparts, must have formed a very secure defence to the garrison who held it. And this garrison would seem to have been composed of the 'first cohort' of the legion, as several altars are so inscribed and dedicated. This gives us a fair means of judging as to the importance of the station as a military defence, and the number of men that formed the garrison. A Roman legion was divided into ten cohorts—the 'first cohort' being twice the strength of the others. This cohort was made up of 1105 infantry and 162 cavalry; and to it was assigned, of right, the post of greatest danger, and the custody of the golden eagles that formed the standards of the legion, and which, when in camp, were kept in the temple and worshipped as gods. That this was so in Bremenium is shown by an altar found there, dedicated by 'the first cohort of the Varduli to the genius of our Emperor and of the Standards.' Peace has now made the place a solitude; but very different must have been the aspect of this mountain valley when the city was in full occupation, the hills resounding with the blare of the trumpets with which the Romans were wont to direct the evolutions of the soldiers, whose constant and unremitting exercises were so severe that the absence of bloodshed was all that distinguished them from a real battle.

Seneca says, that wherever the Roman has conquered, there he inhabits. And wherever he inhabited, thither also he brought his gods. Among these were the family deities—the Lares and Penates that were sacred to every household; and among the debris of Bremenium have been found those small statues of Venus and of other deities to whom the household prayers were offered. But while mindful of his own gods, the Roman did not neglect the gods of the country to which he came. To him every place had its peculiar protecting Genius, and these Genii had needs be propitiated if he was to prosper in their abodes. Coming, therefore, to this high City of Bremenium, nearly a thousand

feet above the level of the sea, and overlooked by the still higher summits of the Cheviots, the pious Roman called to mind the spirits that dwell in these hilly solitudes; for here has been found an altar dedicated to the 'Gods of the Mountains, by Julius Firminus, a decurion'—that is, a humble commander of ten men. Nor were the national heroes forgotten; for one relic was discovered on which Faustulus was figured standing over Romulus and Remus and the wolf. Many other memorials of that old Roman occupation have been dug up here—pieces of chain-mail, spoons, hairpins, little figures that may have been the toys of children, numerous fragments of coral-red Samian ware that had been esteemed then as the collectors of bric-a-brac among ourselves esteem their old china, some of these fragments showing that the originals had been mended with rivets.

Of the actual history of the city while in the possession of the Romans we know nothing. It was in all likelihood the military genius of Lollius Urbicus that selected its site and prepared its defences; and it may have been visited by the great Emperor Severus, when, with his queen and his two infamous sons, he arrived at York in 208 A.D., and thence started on his great campaign against the tribes of Caledonia. But that active Emperor was not now as he had been fifteen years previously, when, at the head of his Pannonian legions, he marched on foot and in full armour, eight hundred miles in forty days, to take possession of the Imperial crown at Rome. For he was now over sixty years of age, and a sufferer from gout in the feet, so that he had to be carried in a litter all the way from Rome to York. With a great army he left the latter city, following no doubt the line of Watling Street to the Northern Wall, where, beyond the Forth and Clyde, the Caledonian unconquerables had their home. These, however, on this occasion adopted Fabian tactics, with the result that, although he had not fought a single battle, the Emperor came back with a loss of fifty thousand men. His return is said to have been attended by omens of approaching ruin. A negro soldier met him at a halting-place near the Southern Wall, and, presenting him with a funeral wreath, spoke words relating to his death and subsequent deification. 'Thou hast been all things,' said the dusky soothsayer, as he offered the ominous wreath—'thou hast conquered all things; now, therefore, be the God of Victory.' Severus passed on; but, in the following spring, as he was preparing at York for a second campaign against the northern tribes, he died, and his body was borne to Rome for burial.

It is not improbable that, both in going and returning on his bootless campaign against the Caledonians, the great Emperor rested and passed the night in the City of Bremenium, when the golden eagles would be lodged in the sacred temple beside the prætorium. Traces of immense camps, of the temporary kind, are to be found on the Watling Street in the vicinity, and were evidently intended for the accommodation of great bodies of men. But the further history of the city is unknown. Coins have been found in it, from the very scarce ones of Otho to those of Carausius—the latter the same who, in 287 A.D., took possession of Britain, and held it against the Romans

* A hypocaust was an arched chamber under the floors, in which a fire was placed, the heated air being conveyed to the apartments above by earthenware pipes.

for seven years, when he fell under the dagger of one of his own servants. With this episode it is just possible that the Roman occupation of Bremenium came to an end. Carausius had enough to do to repel his enemies on the south, and he probably left the Romanised Britons on the north to look to themselves; in which case the camp of Bremenium would shortly be devastated by the fierce Picts. Rome herself was in her decline. After holding our country much longer than we have yet held India, she was forced by her internal necessities to withdraw her troops from Britain; and all that is left among us of the greatest Empire of the world are a few such relics and ruins as have been found at Bremenium. Rome, in teaching the barbarians her arts of war, taught them how they might conquer herself; and that very year in which the Romans left Britain for ever, the Imperial City itself was stormed and sacked by the Goths. So passes the glory of the world!

J. R.

MY SHIPMATE LOUISE.

THE ROMANCE OF A WRECK.

CHAPTER XVII.—THE 'MAGICIENNE'

THE corvette looked a mighty long distance away from the low elevation of the boat's gunwale: almost as far as the horizon, it seemed to my eyes, though from the height of the deck of the Indianman the sea-line showed something above the bulwarks of the man-of-war. One hardly noticed the movement in the sea on board the *Countess Ida*, so solemn and steady was the swing of the great fabric, a movement stealing into one's thoughts like a habit, and leaving one unconscious of it; but the heave was instantly to be felt in the boat, and I own that I could not have believed there was so much swell until I felt the lift of the noiseless polished fold and marked the soft blue volume of the water brimming to the hot and blistered sides and green sheathing of the Indianman.

A huge lump of a ship she looked as we were swept away from her: her masts soaring in three spires with the flash of a vane above the airy gossamer of the loftiest cloths: groups of passengers watching us from the violet-tinted shadow under the awning, heads of seamen at the rail, or figures of them upon the forecabin near the huge cathead that struck a shadow of its own into the water under it.

'A grand old ship,' exclaimed the lieutenant.

'I had no idea she owned such a handsome stern,' said Colledge; 'quite a blaze of gilt, I do protest, Miss Temple. How gloriously old Keeling's cabin-windows sparkle amid the gingerbread magnificence of decoration.'

'What is there in the art of painting to reproduce such a picture as that?' exclaimed Miss Temple, with her dark eyes glowing to the mood of delight raised in her by the beautiful spectacle. 'It is like looking at an image in a soap-bubble. What brush could fling those silver-bluish daintinesses of tint upon canvas, and make one see the ship through this atmosphere filled with ocean-light?'

'Ocean-light!' exclaimed the lieutenant, viewing her with an air of profound admiration;

'that is the fit expression, madam. Light at sea is different from light on shore.'

'As how?' cried Colledge.

'Oh, my dear fellow, see what a reflecting eye the ocean has,' said I; 'it stares back in glory to the glory that looks down upon it. Mould and clay can't do that, you know.'

'True,' said the lieutenant.

'Pray,' said I, addressing him, 'when you overhauled that hull yonder, did you meet with anything to warrant our suspicion that she was a rover?'

'I found no papers,' said he; 'forward, she is burnt into a shell. All her guns are gone, dropped overboard, I suppose, to keep her afloat. She has a little round-house aft, and in it sits a man.'

'A man?' exclaimed Miss Temple.

'He sits in a musing posture,' continued the lieutenant; 'he frowns, and seems vexed. He holds a feather pen in one hand, and supports his head on the elbow of his left arm, but he doesn't write: possibly because there is no ink and the wind seems to have blown his paper away.'

'Is he dead?' exclaimed Miss Temple.

'Quite,' responded the lieutenant with a smile of enjoyment of her beauty.

'Bless me!' cried Colledge, staring at the hull under the sharp of his hand.

'Is she a picaroon, think you, sir?' said I.

'Impossible to say,' he answered; 'there are stands of small-arms in her cabin below, and a sweep of 'tween-decks full of piratic bedding. She will have been crowded with sailors, I should think, sir.'

The six men-of-war-men were making the fine little cutter hum as they bent to their oars, one hairy face showing past another, the eyes of each man upon his blade, though now and again one or another would steal a respectful peep at Miss Temple. What exquisite discipline their demeanour suggested! One hardly needed to do more than glance at them to sound to the very depths the whole philosophy of our naval story. How should it be otherwise than as it is with a nation that could be the mother of such children as those fellows?

The lieutenant was very talkative, and had a deal to say about the west coast of Africa and Cape Town; and he had a great many questions to ask about home. Miss Temple constantly directed her eyes over the side, as though affected and even startled by the proximity of the mighty surface. And boundless the light blue heaving plain looked as it went swimming to the far-off slope of sky that it seemed to wash—the vaster, the more enormous for the breaks of toy-like craft upon it; for the Indianman and the corvette were standards to assist the mind into some perception of the surrounding immensity.

It was a longer pull than I should have believed, and roastingly hot, thanks to the flaming reflection that filled the heart of the sea, and to the motionless atmosphere, which was scarcely to be stirred even into the subtlest fanning of the cheek by our passage through it. Miss Temple's face in the shadow of her parasol resembled some incomparable carving in marble, and but little of vitality was to be seen in it outside of her rich, full, eloquent eyes, when she

fell into some pause of thought and looked away into the dim blue distance as though she beheld a vision down in it. The corvette appeared deserted with her high bulwarks topped yet with a line of hammocks; but it was easy to see that it was known on board the lieutenant was bringing a lady along with others to visit the man-of-war, for there was already a proper gangway ladder over the side, with a grating to step out on, though the broad-beamed craft swayed more to the swell than the Indianan, and so dipped the platform that it needed a deal of manœuvring to save Miss Temple from wetting her feet.

Sir Edward Panton, a tall, exceedingly handsome man, with iron-gray hair and a sun-red-denied complexion, received us at the gangway. He seemed scarcely able to believe his eyes when Colledge called out to him. He welcomed Miss Temple with an air of lofty respectful dignity that would have sat well upon some nobleman of magnificence welcoming a royal visitor to his home. Chairs were brought from the cabin and placed on the quarter-deck in the shelter of the awning, along with a little table, upon which were put some excellent sherry, claret, and seltzer-water, and a box of capital cigars. The look of this ship, after the Indianan's encumbered decks broken by their poop and topgallant forecandle, was a real treat to the seafaring eye. She was flush fore and aft; every plank was as white as a peeled almond; the black breeches of her artillery gave a noble, massive, imposing character to her tall immensely thick bulwarks; the ratlines showed straight as thin bars of iron in the wide spread of shrouds and topmast rigging; the running gear was flemish-coiled; the brass-work sparkled like burnished gold; the snow-like cloths of the fore-course gathered an amazing brightness from their mere contrast with the red coat of a marine pacing the forecandle; the sailors in white clothes, straw-hats, and naked feet, sprang softly here and there to the light chirrupings of a pipe, or went on with the various jobs they were about on deck and in the rigging amid a silence that one might ask for in vain among a crew of merchantmen.

Sir Edward was delighted to see his cousin, and it seemed as if there was to be no end to their talk, so numberless were the questions the commander put about home, his family, doings in London, matters political, and so on, and so on. I had a chance, whilst Colledge was spinning some long twister of private interest to Sir Edward, to exchange a few words with Miss Temple, whose behaviour in the main might have easily led me to believe that she was absolutely unconscious of my presence; in fact, I shouldn't have addressed her then but for finding in the domestic and personal gossip of the two cousins an obligation of either talking or walking away.

'The Countess Ida looks a long distance off, Miss Temple.'

'Farther, I think, than this ship looks from her.'

'That is owing to a change in the atmosphere. We shall be having some weather by-and-by.'

'Not before we return, I hope.'

'The blue thickens yonder,' I exclaimed, indicating that quarter of the sea where I had noticed the depression of the horizon.

She gazed listlessly; her eyes then went roaming over the ship with a sparkle in them of the pleasure the whiteness and the brightness and the orderliness of all that she beheld gave her.

Presently Sir Edward exclaimed: 'Miss Temple, you would like to inspect this vessel, I am sure. I wish to show Stephen my wife's portrait, and I want you to see it.—Mr Dugdale, you will join us?'

Down we went into a very pleasant cabin, and the captain produced a water-colour sketch of his lady.

'A sweet face!' exclaimed Miss Temple; whilst Sir Edward gazed at the picture with eyes full of the yearning heart of a sailor long divorced from his love.

'Have you found your charmer yet, Stephen?' said he. 'Any girl won your budding affections?'

The youth looked at me suddenly and turned of a deep red. I believe he would have said no at once, and with a cocksure face, had I not been there. Miss Temple's gaze rested upon him.

'Why, who is it, Stephen, eh?' exclaimed Sir Edward with a merry laugh.—'See how he blushes, Miss Temple! a sure sign that he has let go his anchor, though he is riding to a long scope all the way out here.—Who is it, Steve?'

'Oh, hang it, Ned, never mind; you bother a fellow so,' answered Colledge with a fine air of mingled irritation and confusion, and a half-look at me that was just the same as saying, 'What an ass I am making of myself!'

'Miss Temple,' exclaimed Sir Edward, laughing heartily again, 'he may possibly have confided the lady's name to you?—Pray, satisfy my curiosity, that I may congratulate him before we part.'

'I am as ignorant as you are,' she replied with an expression of cold surprise in her face.

I marched to a porthole to look out, that I might conceal an irrepressible grin.

'I say, show us the ship, will ye, Ned?' shouted Colledge; 'there's a long pull before us, and we're bound to India, you know.'

Captain Panton led the way out of the cabin, and went in advance with Miss Temple, pointing here and explaining there, and full of his ship. Colledge sidled up to me.

'Dugdale,' he exclaimed in a whisper, 'do you believe that Miss Temple will guess from my idiotic manner just now that I'm engaged to be married?'

'Oh yes; I saw her gaze sink right into you and then go clean through you. It is best as it is, Colledge. You may breathe freely now.'

He smothered an execration, and continued gloomy and silent for some time. There was not very much to be seen below. We were presently on deck; and after another ten minutes' chat, during which Colledge seemed to regain his spirits, the boat was ordered alongside.

'It shall be my secret as well as yours, Stephen, long before you are home from your tiger-hunts!' exclaimed Sir Edward at the gangway, waggishly shaking his forefinger at his cousin.

We shook hands, entered the boat; the lieutenant took his seat, the oars sparkled, and away we went with a flourish of our hats to the

commander, who stood for some time in the open gangway watching us.

'There's a trifle more swell than there was, I fancy,' said I to the lieutenant.

'I think there is,' he answered, looking over the sea with a face as if he thought of something else.

'What a confounded quiz Ned is,' exclaimed Colledge. 'He's rather too fond of a laugh at other people's expense. I think that sort of thing a mistake myself.'

'He is a very handsome gentleman,' said I.

'Well, I'm mighty glad to have seen him,' said Colledge. 'He's a dear good fellow, only—I hope you've enjoyed the trip, Miss Temple?'

'Thoroughly, thank you; it is a delightful change.—How strange to think of that toy yonder as being our home for some months to come! It is like fancying one's self as dwelling in a star, to see her floating out there in the blue haze, as though she were poised in the atmosphere.'

She fastened her eyes on the Indiaman as she spoke. One saw in this that she had a sailor's observation for atmospheric effect. Star-like the ship looked in the distance—a dash of misty light in the blue haze, hovering as it were above the junction of sea and sky, where the blending of the elements was so dim and hot that you couldn't tell where they met.

'Isn't it thickening up a trifle, somehow?' said I to the lieutenant. 'Look to the right of the wreck there—what is that appearance?'

'What do you see?' he exclaimed.

'Why, to my fancy, it is as though there were a dust-storm miles away yonder.'

He smiled, and answered: 'Mere heat. One doesn't need many months on the west African coast to grow used to that sort of aspects. They suggest nothing but quinine to me.'

'What time is it?' said Colledge.

We pulled out our watches: it was half-past four.

'I am sorry we are returning to the Indiaman,' said he. 'I should like to get away from her for a little while; then one would find something of freshness in her when one returned. I am not thirsting to meet Mr Johnson and Mr Emmett and Mr Greenhew again.—Are you, Miss Temple?'

She slightly smiled, and said: 'I wish Bombay were as near to us as the *Magicienne* is to the Indiaman.'

'I have an idea!' cried Colledge, whose shining eyes methought seemed to suggest the influence of the last large bumper of sherry he had tossed down before leaving the corvette. 'Let us kill another hour by boarding the wreck.'

'I shall be very pleased to put the boat alongside,' said the lieutenant.—'What do you say, Miss Temple?'

She looked at the Indiaman, and then sent a swift glance at me, as though she would read my face without having me know she had peeped at it.

'Will there be time before it falls dark?' she answered. 'I am in no hurry to return; but I do not want to make my aunt miserable by remaining out upon the water until after sunset.'

'Oh, we have abundance of time,' said the lieutenant.

'It will give us so much to talk about,' exclaimed Colledge. 'I want to see what sort of a ship it was that frightened us so abominably the other day.'

'What do you say, Mr Dugdale?' said Miss Temple.

'I am thinking of the lonely sentinel this gentleman was telling us about as we came along,' said I.

'Oh, one peep! one peep at him, just one peep!' cried Colledge; 'don't let us go back to the Indiaman too soon.—At this rate,' he added, turning up his slightly flushed face to the sky, 'we may have another six months of her.'

The lieutenant laughed, and, anxious to please him, as I supposed, quietly pulled a yoke-line and swept the boat's head fair for the hull. His making nothing of the appearance I had called his attention to was reassuring. I should have thought nothing of it either but for the indent in the horizon that morning, and the recollection that grew out of it, as I have told you. But then old Keeling had let us start from his ship without a hint, and Sir Edward had uttered no caution, though, to be sure, in those days the barometer was not the shaper of marine speculations it has since become; and the silence of these two skippers, and the smile and careless rejoinder of the lieutenant, should have been amply satisfying. Nevertheless, there was no question but that the light swell heaving out of the north-west was sensibly gaining in volume and speed, and that it was the mere respiration of the ocean I could by no means persuade myself, though it might signify as little.

Colledge grew somewhat frolicsome; indeed, I seemed to find an artificiality in his spirits, as though he would clear Miss Temple's memory of Captain Pantou's *badinage* by laughter and jokes. The lieutenant fell in with his humour, said some comical things, and told one or two lively anecdotes of the blacks of that part of the coast the corvette was fresh from. The men-of-war-men pulled steadily, and the keen stem of the cutter sheared through the oil-smooth surface with a noise as of the ripping of satin; but now and again she would swing down into a hollow that put the low sides of the wreck out of sight, whilst, as we approached, I noticed that the hull was leaning from side to side in a swing which did not need to greatly increase to put the lieutenant to his trumps to get Miss Temple aboard.

But by this time the girl was showing some vivacity, smiling at the lieutenant's jokes, laughing lightly in her clear, rich, trembling tones at Colledge's remarks. It seemed to me as if her previous quietude had produced a resolution which she was now acting up to. She was apparently eager to inspect the wreck, and said that such an adventure would make a heroine of her at home when she came to tell the story of it.

It was a long dragging pull over that heaving breathless sea, and through that sweltering afternoon with its sky of the complexion of brass about the zenith. The three craft as they lay formed a right angle triangle, the apex, to call it so, being the derelict, and the getting to her involved a longer stretching of the Jacks' backs than, as I suspected, the lieutenant had calculated on. The

sweat poured from the men's brows, and their faces were like purple rags under their straw hats as they swung with the precision and the monotony of the tick of a clock over the looms of their oars.

'She's rather unsteady, isn't she?' exclaimed Colledge as we approached the hulk.

'So much the better,' said the lieutenant; 'her bulwarks are gone, and every dip inclines her bare deck as a platform for a jump.'

'She may be sinking,' cried Miss Temple.

'Dry as a bone, madam, I assure you,' said the officer. 'I looked into her hold, and there's scarce more water than would serve to drown a rat.'

'I see her name in long white letters under her counter,' I exclaimed. 'Can you read it, Colledge?'

'The *Aspirante*,' said the lieutenant.

We now fell silent, with our eyes upon the hulk, whilst the officer manœuvred with the yoke-lines to run the cutter handsomely alongside. A single chime from a bell came thrilling with a soft silver note through the hushed air. Miss Temple started, and the officer grinned into Colledge's face, but nothing was said. She was a very clean wreck. Her foremast stood stoutly supported by the shrouds; but the braces of the foreyard were slack, and the swing of the spar, upon which the canvas lay rolled in awkward heaps, roughly secured by lines, as though the work of hands wild with hurry, somehow imparted a strange, forlorn, most melancholy character to the nakedness of that solitary mast. She showed no guns; her decks appeared to have been swept; the rise of her in the water proved that her people must have jettisoned a deal of whatever they were able to come at; her wheel was gone, and her rudder slowly swayed to every heave. There were a few ropes' ends over her side, the hacked remains of standing-rigging; but the water brimmed clear of wreckage to her channels.

'Oars!' cried the lieutenant. The bowman sprang erect; and in a few moments we were floating alongside, soaring and falling against the black run of her, with the deck gaping through the length of smashed bulwark to the level of our heads when we stood up, each time she came lazily rolling over to us. The clear chime of the bell rang out again.

'What is it?' cried Miss Temple.

'The ship's bell,' said the lieutenant; 'it'll have got jammed as it hangs, and the tongue strikes the side when the heave is a little sharper than usual.'

He followed this on with certain directions to the men. Two of them, watching their chance, sprang on to the slope of the deck, and then went hoisting up away from us as the hull swayed wearily to starboard. 'Stand by now!' bawled the lieutenant.—'Miss Temple, let me assist you on to this thwart.' She sprang upon it with something of defiance in her manner, and the officer grasping her elbow supported her. I thought Colledge looked a little uneasy and pale. We waited; but an opportunity was some time in coming.

'Mr Colledge,' said the lieutenant, 'be kind enough to take my place and support the lady.' He jumped lightly into the main-chains, and was on deck in a jily. 'Haul her in close, men.—

Now, Miss Temple. Catch hold of my hand and of this sailor's when I say so.'

Up swung the boat; the girl extended her hands, which were instantly grasped. 'Jump, madam!' and she went in a graceful bound from the thwart to the deck.

I watched till a heave brought me on a line with the chains into which I leapt.

'Now, Mr Colledge,' called out the lieutenant. He hung in the wind, and I thought he would refuse to leave the boat; but Miss Temple with her face slightly flushed stood watching as though waiting for him, her noble figure swaying with a marvellous careless grace upon the floating slopes of the planks; and this started him. He got on to a thwart, where he was supported by a sailor till a chance offered for his hands to be gripped, and then he was hauled on to the hull; but he came perilously near to going overboard, for the sudden sinking away of the cutter from under him paralysed his effort to jump, and he swung against the side of the wreck in the grasp of the lieutenant and a seaman, who dragged him up just in time to save his legs from being ground by the soaring of the boat. The two sailors then jumped into the cutter, which shoved off, and lay rising and falling upon the quarter to the scope of her painter.

(To be continued.)

THE TUBEROUS BEGONIA.

THE Geranium, or, as it is now more correctly called, the Zonal Pelargonium, has long been unrivalled among the denizens of our flower-gardens. Its brilliancy of colour, easiness of propagation and culture, hardiness and general good qualities, have justly made it a universal favourite, and by far the most extensively grown of all our ornamental plants. Indeed, it has been so much used, especially in that kind of gardening arrangement called 'bedding-out,' that variety of form and colour, which is the most pleasing to the eye, has been sacrificed for uniformity, and too often our gardens have been laid out in a style that brings to mind Pope's satirical description of the gardens at Canons:

His gardens next your admiration call:
On every side you look, behold the wall!
No pleasing intricacies intervene;
No artful wildness to perplex the scene;
Grove nods at grove, each alley has a brother,
And half the platform just reflects the other;
The suffering eye inverted Nature sees,
Trees cut to statues, statues thick as trees.

This, while being a matter for regret, has been, perhaps, unavoidable; as there has not been, until quite recently, any plant possessing anything like the good qualities of the Geranium which might have been used as a substitute. We have, however, within recent years, by the skilful and tenacious labour of our scientific florists, secured another ornamental plant, which already has equal if not superior merits to the Geranium, and promises to be deserving of as much popularity and general cultivation as that old-time favourite. This welcome addition to our garden treasures is the Tuberous Begonia. A short sketch of its history and improvement under cultivation may be interesting to those who find pleasure in gardening.

The Begonia family—so called after M. Begon, a French botanist—contains about three hundred and fifty species. About one half of this number has been already introduced into Britain. The known species for the most part are natives of tropical America, Asia beyond the Ganges, and the southern tropics and sub-tropics of Africa. In these parts of the world they are found growing in great abundance. As a botanical family, the Begonias are isolated from any other group in the vegetable kingdom, their characteristics being distinct and easily recognised. They have succulent or sub-shrubby stems, or climbing stems which cling to moist surfaces by adventitious roots. Their leaves are stipulate—that is, having small leaf-like appendages at the bases of the leaf-stalks, and are generally ornamental. The flowers are irregular, and male and female blooms are produced on each plant. The stamens are numerous, and sometimes free, sometimes united. The ovary, which is adherent throughout to the calyx, is three, four, or many celled. The fruit is a three-cornered, sometimes winged capsule.

The Begonia's nearest allies are four species forming the Datisceæ family, which are similar in the structure of their unisexual flowers, ovary, and seeds. The Passion-flowers, Saxifrages, and Cucumber have also a slight affinity to it.

Besides the above general features, there are other interesting characteristics seen in the structure of some members of the family. For example, in the species *Begonia phyllomanica* the stems are densely covered with small adventitious leaves. Many species, again, may be propagated from leaves alone, while others produce numerous small bulbs in the axils of the leaves, as in *Lilium bulbiferum*, from which new plants may be raised.

So far as can now be determined, the first species brought to this country was *Begonia nitida*, which was found in Jamaica in 1777. Other species were introduced from time to time; but it was not until close on a hundred years after its first introduction that the Begonia entered on its career of popularity, and developed such surprising tendencies to vary and improve in the hands of the cultivator, that to-day it stands in the front rank of our decorative plants.

We owe the introduction of the species of the Begonia from which the varieties now grown were derived to one of our foreign-plant collectors—a class of men about whom we hear very little, yet to whom we owe much for enriching our gardens and conservatories by searching out, often at the risk of their lives, and sending home to us, beautiful plant-children of other lands. Richard Pearce, a native of Plymouth, and a man of unassuming character yet intrepid courage, while collecting in Bolivia, discovered and sent home, in the year 1864, the variety *B. boliviensis*; in 1865, *B. Pearcei*, also from Bolivia; and in 1867, *B. Veitchii*, from near Cuzco, Peru. To these were soon added, also from Peru, the species *B. roseiflora*, *Davisii*, and *Clarkei*. These six species were the progenitors of all the varieties of Tuberous Begonia now cultivated. It may be interesting to note the colours of the flowers produced by these species. They are respectively bright cinnabar-scarlet, clear yellow, vivid ver-

million, pale brier-rose red, bright scarlet, and bright rose.

In 1868 the first hybrid was raised, and was named *Begonia Sedeni*, after the raiser. It produced blooms of a beautiful rosy-crimson colour. From that year up to the present time many of our leading florists, as well as those of the Continent, recognising the beauty and promise of improvement in the Begonia, have, year after year, given their closest attention to its culture; and every season's labour has invariably produced one or more varieties distinctly marking an advance from previous attainments.

The results secured up to the present are simply marvellous, and show what may be done in the field of floriculture by earnest, persistent, and well-directed work. From its introduction in 1777 up to as late as ten years ago, the Begonia was little more than a botanical curiosity. The habit of the varieties then in existence was very weak. The stems were usually gaunt straggling branches, two feet or more long, scant of foliage, and surmounted by one or two small, thin-petalled, poorly-coloured flowers, which hung their heads in a melancholy fashion. No one looking at them could have dreamt that they would be the progenitors of a race of plants with such wonderful beauty of form and colour as that now possessed by their descendants. The family has developed with such rapid strides that to-day it possesses a larger number of valuable qualities than any other flowering-plant, with the possible exception of the Zonal Pelargonium (*Geranium*).

The good points of the Begonia as now improved, are: The power of flowering continuously over a period of five or six months in the year. A range of colour embracing almost every conceivable shade of white, rose, pink, red, scarlet, crimson, lake, orange and yellow, with the richest and most delicate tints. A wonderful adaptability to any kind of culture, either with or without artificial heat. Great freedom from any kind of plant disease. It can be used most successfully as a 'bedding-out' plant. The last is perhaps its most valuable quality, and for which it will be most extensively grown, as it makes a good companion to or substitute for the too much employed Zonal Pelargonium. That it can be used as a bedding plant with fine effect is now beyond dispute. In widely-separated localities both in England and Scotland the writer has seen Begonias growing in the open air from June to October with great vigour and luxuriance. They withstand extremes of heat and cold much better than the Zonal Pelargonium. Come sunshine or shade, rain or storm, their richly-coloured blossoms look up ever bright and fresh. In wet, cold seasons, when its rival produces only a very limited number of flowers and seems only to live, the Begonia will grow vigorously and throw up a bloom from every joint.

The single varieties with scarlet and crimson flowers, of which colours there are many different shades, give the best results in the open air. It would be difficult to imagine a grander gardening effect than that produced by a mass of healthy plants, with flowers of these bright colours, in full bloom under bright sunshine.

In the immediate future, the Begonia must take a prominent place in all kinds of gardening decoration. It is hardly possible to plant it where it

will be out of place. It looks pleasing in nearly any position and arrangement, whether planted in separate colours, in mixed beds, in isolated groups, in hollows of rustic stumps, in ornamental stands, in ivy-clad baskets, or as single specimens.

To those who find, like Bacon, that gardening is the source of pure pleasure and refreshment of spirit, the Begonia will come as a welcome addition to the sum of their enjoyment.

MY WEDDING DAY.

A SOUTH AUSTRALIAN STORY.

CHAPTER II.—CONCLUSION.

'WHAT time is it?' asked Mrs Green, when the two women had started up the hill once more.—'Two o'clock? You don't say so! Well, we may as well have a bit of something ourselves. The fire will be on the top of that hill in half an hour, at the rate it is coming. If they can't stop it, it will come down here, and we'll have to turn to and fight with the rest of them.'

'We'll have to look out, anyways,' said Biddy. 'The sparks will be all over the place, with this wind, and it's not much time we'll have then to be thinking of dinner.'

The children were called in; and we sat down to a picnic sort of meal, consisting of cold beef, plum-pudding, and a tart or two from the unfortunate wedding breakfast. These tarts reminded me of a fact that I found hard to realise—that I was really married, and that this was my wedding day; yes, actually my wedding day! and here was I, the bride, sitting down to a demoralised sort of Christmas dinner in a hot kitchen, with a half-roasted clergyman in his shirt sleeves, and Mrs Green in a voluminous cooking apron.—And Jack? Where was he? Over a mile away, fighting the fire in heat and dust and smoke. In danger, perhaps! Oh Jack, dear Jack! And I lost myself in loving anxious thought, till I was roused by Biddy's voice: 'My word!' she said, coming to the back door—'it's near now, roaring like anything, and they're beating like mad.'

We jumped up at once and went outside. There was a fierce deep roaring rushing sound like a big bush-fire, and nothing else. The smoke hung over us thicker than ever, and like a lurid cloud kept off the sunlight, the sun itself showing through it as a dull deep crimson disc; and through the roaring and crackling of the flames we heard the sound of the branches as the men fought with all their might.

While we watched, Mrs Brown and Mrs Jones came hurrying down again, bringing with them some of the eatables they had just taken up.

'They've no time to eat,' said Mrs Brown; 'but they're just dried up with thirst. They want some more tea as soon as you can send it up.'

'I will take it,' I said.

'Pray, allow me,' said Mr Smith.

'Well,' said Mrs Green, 'I expect Mrs Brown and Mrs Jones are tired; besides, they want their dinner.'

I went in search of my shadiest hat, and the parson donned his coat—a great mistake, as it proved—and we started off, he with two buckets of tea, and I with one. Now, full buckets are

awkward things to carry up a hill-side at the best of times, and when they are full of tea, every drop of which you know will be precious to the thirsty men above, you get nervous, and consequently spill more. Mr Smith started with a light heart to carry those buckets up that hill, and if his heart was heavier when he reached the top, the buckets were considerably lighter. We got on well enough at first, but soon came to a steep place, where, though our arms were aching furiously, there was no place flat enough to set the buckets down on. Then we had to sidle along the hill, and Mr Smith had to hold one bucket higher than the other to keep it off the ground; and in spite of all his care, that up-hill bucket would keep catching on sticks and stones, and sending cataracts of steaming tea over his legs. He did not complain; but it must have been too hot to be comfortable. At last we got on to a cattle track, which made walking easier, though it had its drawbacks too, being six inches deep in soft well-trodden dust. The condition of the parson's moist legs after two minutes' walk through this may be imagined. He sailed benignly on, however, with one long coat-tail in each bucket of tea, till I could stand it no longer.

'Mr Smith,' I said, 'I am afraid the tea will spoil your coat.'

'Dear me! dear me!' he said, 'what shall I do? They will go in, and I can't put the buckets down, and the tea will be spoilt. Dear me! what shall I do?'

'Shall I pin them up for you?' I asked.

'Thank you, thank you, Mrs Rushton, if you would,' he answered gratefully.

I managed to set my bucket down and steady it with my foot while I pinned the tails of his coat together behind, so that it looked like a demented swallow-tail.

'Thank you, thank you, very much indeed,' was all he said just then; but when we came to a place where we could set down our loads and rest, he observed, as he mournfully gazed at his muddy legs: 'Really, Mrs Rushton, I am afraid this kind of work is detrimental to my cloth.'

At last we reached the top, and found the men hard at work. The fire had come upon them before they expected. Where a track was already burnt, they stopped it easily enough; but just here they were having a hard fight. So much we learned from one and another as they stopped to swallow a pannikin of tea and then rush back to their work again. How hot they looked; hot and tired, with faces scorched and grimy, and eyes red with the stinging smoke. I had seen thirst before, though not quite so bad as this. Mr Smith had not, I think, and his face grew very grave as he watched them.

'Well, parson,' said one, as he drank the tea, in a voice husky and weak with exhaustion, 'you're a Christian for this, if you never said a prayer.'

The little clergyman looked distressed; he was a little shocked at first, I think; then I heard him murmur to himself: 'A cup of cold water! I never knew what that meant till to-day.'

When we got down again, he insisted on making another trip at once. I could not help admiring him as he started up the hill again with a bucket in each hand, this time without his coat.

'Well,' said Biddy, looking after him, 'he's got some pluck in spite of his coat.'

'He's a brick!' said the children, and I quite agreed with them.

The fire was stopped on the hill behind the house, and the men had gone along the ridge to stop it farther on. We had dismantled the neglected breakfast table, and rearranged it with more regard for compactness than elegance, ready for the men's supper; and at last the long hot day was nearly over. Having nothing particular to do, I went and sat under the back veranda to rest. Mrs Jones did likewise, and leaning her elbows on her knees and her chin on her hands, gazed silently upwards at the smoke that told of the fight still going on. Mrs Brown seized a broom and proceeded to sweep up the leaves scattered about by our discarded decorations, talking meanwhile about other bush-fires she had seen. Now that the fight was no longer in sight, the sense of excitement and conflict we had felt all day in some degree abated. Peaceful home sounds—the crying of a calf, the musical sound of milking from the bail-yard close by, and the cheerful tinkling of teaspoons in the kitchen—contrasted strangely with the lurid glare of the smoky sunlight and the distant roaring of the flames. In a gum-tree close by were a crowd of magpies that had flown screaming away from the fire, and were watching it intently, now and then bursting into a flood of angry song; while once or twice a flock of paroquets whizzed shrieking overhead.

I paid little attention to Mrs Brown's conversation, but fell to thinking—of Jack, of course—till Biddy came across to the dairy with her buckets of milk, and Mrs Green came out and called the children in to tea. They came scampering in, discussing the day's events with a vivacity which put day-dreaming out of the question for the time being.

During tea, the talk was still bush-fires; no one ever talks of anything else while one is burning. Afterwards, when Mrs Brown and Mrs Jones had departed to their respective homes—cottages a little distance off—and Mrs Green and Biddy were busy preparing for the men, whom they expected soon, I sat on the veranda and tried to talk the children into a calm enough state of mind for bedtime. It had been a wildly-exciting day for them, and a 'continual feast' as well; for they had made raids on the kitchen every now and then, carrying off their booty to be devoured in some place where there was a good view of the fire. They implored me not to speak of bed at first; but in spite of themselves they grew drowsy as they calmed down, and were soon ready to say 'Good-night.'

When they had gone I lost myself in my own thoughts again. How long I sat there dreaming I do not know. The sun had set; the short twilight was over, and the smouldering logs shone out like large red stars from the blackened hillside above, when I noticed a strange light to my left. Going to the end of the house, I saw a line of fire coming towards us along the flat. A smouldering log must have rolled down from above and lighted the grass. 'Fire! fire! just here!' I shouted.

Mrs Green and Biddy rushed out, and took in

the situation at a glance. Biddy just threw back her head, put her hands to her mouth and 'coo-ee!' loud and long.

'Get a can and wet the grass at the end of the house, Mary!' Mrs Green called to me as she ran round the house shutting the windows, to keep the sparks out.

'Biddy,' she continued, 'throw water on the roof; it's as dry as tinder.'

Biddy gave one more long 'coo-o-ee!' and seizing a bucket, fell to work; while Mrs Green disappeared into the house, returning with the children, blinking and bewildered. Rolling them in blankets, she deposited them in the bed of a dried-up creek near the house. Meanwhile, I had been running backwards and forwards with two large watering-cans from the tubs we had filled in the morning, trying to soak a strip of grass to check the fire in its advances on the house. My task was only half finished, however, when the fire came up. I caught up a branch and called to the others for help. We beat and beat with all our might; but the wind was high and the grass long, and it seemed as if we could not keep it back. The heat was intense, and the smoke choked and blinded us; but we kept on, till I felt as if each blow would be the last, and dimly wondered what would happen when I gave in, as I must do soon.

I do not know how long we worked; it seemed hours; but I suppose it was not many minutes. All at once we heard men's voices and running feet, and a dozen strong arms were beating beside us. It was a sharp tussle; but they got it under, and were just congratulating themselves on arriving in the nick of time, when a voice—Jack's voice—was heard calling for help, and they saw that the fire, though turned away from the house, was making straight for the wool-shed, which stood on a slight rise a little beyond. Jack was fighting it single-handed. It seemed to be getting the better of him; then, while I watched, I saw him fall, and the fire rushed onwards. And then I suppose I fainted, for I remember nothing more till I felt myself slowly and painfully coming back to life in my own little room. At first, I was only conscious of a deathly sick feeling; then I remembered that something had happened, something dreadful. What was it? Ah!—Jack. I believe I called his name aloud; and then—could it be true?—I heard his dear voice answering me, and felt his strong arms and his kisses on my face. It was no dream, but Jack himself! I hid my face on his shoulder and sobbed. I have a dim remembrance of hearing some one say, 'She'll do now;' then the door was shut and we were alone. I had my arms round his neck, and clung closely to him, unwilling to loose my hold even to look up at his face.

'Hush, Mary,' he said—'hush, my darling. I am here, safe and sound. Look up, dear, and see for yourself.'

At last I did look up. Could that be Jack? It looked more like a badly-blackened Christy minstrel. 'Why, Jack!' I cried, 'you are as black as a'—and I paused for want of a simile.

'A kettle?' he suggested.—'Come, little woman, don't call names. I fancy there's a pair of us,' he added, looking laughingly at me.

Of course I sat up at once, and looked towards the glass to see what was the matter, and this is what I saw—Jack kneeling by the side of the couch, looking like a sadly-dishevelled sweep, for one of his shirt-sleeves was burnt off to the shoulder, and he was more or less black all over; while his eyes were red, and his teeth, displayed just now by a broad grin, shone like a negro's from beneath the singed and stubbly ends of what had once been his moustache. As for me, my light cotton dress was ornamented by sundry prints of a human hand in black, while round my waist was a broad band of the same hue. My left cheek was one dark smear; while on the other, as well as on my forehead and lips, were numerous rough but unmistakable impressions of Jack's moustache.

It was no use trying to be sentimental under the circumstances, so I laughed instead, to Jack's relief, for he had a man's hatred of scenes.

'How did you escape?' I asked. 'I thought I saw the fire go over you.'

'Why, so it did,' he answered. 'When I found I could not stop it, I lay down, and let it go over me.'

'Oh Jack! you must have been hurt.'

'Well, I found it rather warm, certainly; and I am afraid my clothes have suffered.—There, there, little wife; don't cry like that.' The thought of his danger had been too much for me. 'I am quite safe, thank God. I don't think I am seriously damaged, though my complexion is a little spoiled for the present.'

He stayed talking a little while, and then had to rush back to his task. They had just managed to save the wool-shed, but a good deal of fencing had gone. The worst of the fire was over, but it needed watching.

Next morning, a rather dilapidated but very happy bride and bridegroom started on their homeward way, after saying good-bye to a still more dilapidated parson, and being honoured with three very husky cheers from all hands.

OLD SHOWS AND CUSTOMS.

WITH the spread of education the various old customs so familiar to our forefathers are gradually dying out. Our old friends Punch and Judy show themselves less every year, while their rival Fantoccini has quite left the field. It is true that Punch was in greater demand in the Jubilee Year; but he, with his friends the Travelling Showman, the Fat Lady, and the Skeleton Boy, are daily finding themselves nearer the end of their existence. For this we do not pretend to offer any explanation other than that the public, naturally wishing to see all they can for as little as possible, are not so liberal with the pence, or that the pence are not so plentiful. This, however, cannot be the case with the old customs which our ancestors associated with the great festivals of the year, and it is of some of these we wish to speak.

Every one is acquainted with the practice of giving eggs at Easter-tide; these are now generally made of sugar or some kind of composition; but their preparation used formerly to occupy, for a

few days before Easter, a good deal of the time of the donor. They were called *pask*, *paste*, or *pace* eggs, terms derived from the word *paschal*, and were made as follows: an ordinary egg having been immersed in hot water, the end of a common candle was made use of to inscribe names of individuals, &c. Thus inscribed, the egg was placed in a dye; and the part over which the tallow had been passed being impervious to the operation of the dye, the egg presented a white inscription on a coloured ground.

An old custom formerly prevalent in many parts of England was that of 'heaving' or 'lifting,' mostly performed in the open street. People formed into parties of twelve or more, and from every one 'lifted' they extorted a contribution. There is said to be a record in the Tower of London of certain payments made to ladies and maids of honour for taking King Edward I. in his bed at Easter, whence it has been presumed that he was lifted according to the custom which then prevailed among all ranks throughout the kingdom.

A custom prevailed at Twickenham of dividing two great cakes among children on Easter Day; but in 1645 parliament ordered that loaves of bread should be bought for the poor instead, and for some time these were thrown from the church steeple, to be scrambled for, a custom which also prevailed for some time at Paddington.

The great festival of the milkmaids and sweeps of the 1st of May dates its origin back to the Romans, who were wont to commemorate the festival of Flora, the goddess of flowers, for several days in May. Maypoles were forbidden to be erected by parliament in 1644; but they were restored again on the restoration of Charles II.; and in 1661 the Maypole in the Strand was reared with much ceremony and rejoicing. This pole, which stood near where Catherine Street joins the Strand, was of cedar, and was raised by twelve seamen, commanded by the Duke of York, who was then Lord High Admiral of England.

Bartholomew Fair was the last of the great fairs held in London; this took place near Smithfield, and lasted three days, taking place about the beginning of September; and here were to be seen probably the greatest collection of shows of all kinds ever brought together at one place.

Allhallow Eve or Halloween was formerly the occasion of many curious customs throughout the country. It was sometimes called 'nutcrack night' in the north of England, from the practice of throwing nuts into the fire.—Burns says: 'Burning the nuts is a favourite charm. They name the lad and lass to each particular nut as they lay them in the fire, and accordingly as they burn quietly together, or start from beside one another, the course and issue of the courtship will be.' He also mentions the custom of Scotch women of pulling cabbages; they must go out hand in hand blindfolded and pull the first cabbage they come to; its being big or little, straight or crooked, is prophetic of the grand object of their spells—a husband. If any earth stuck to the roots, that was a fortune; and the taste of the *custock* (the heart of the stem) was indicative of the natural temper and disposition. In certain parts of Perthshire, bonfires were lit in every village. When the fire was consumed, the

ashes were carefully collected in the form of a circle; then a stone was put in the fire for each person in the several families interested in the charm, and if any stone was moved out of its place or injured before next morning, the person it represented was supposed not to live twelve months from that day. This same custom was also observed in North Wales.

The inhabitants of the island of Lewis, off the west coast of Scotland, had an ancient custom to sacrifice to a sea-god called 'Shony' in the following manner: Every family furnished a peck of malt, which was brewed into ale. One of their number was then chosen to wade into the sea up to the middle, who carrying a cup of ale in his hand, cried out: 'Shony, I give you this cup of ale, hoping you'll be so kind as to send us plenty of seaware for enriching our ground the ensuing year;' and so threw the ale into the sea. This was performed at night-time. On his return to land, they all went to church, where a candle was burning on the altar; and after standing silent a short time, one gave a signal, at which the candle was put out, and immediately all went to the fields, where they drank their ale and spent the remainder of the night in dancing and singing.

The burning of a good Guy on the 5th of November was once a scene of uproar unknown now. A huge bonfire was lit in Lincoln's Inn Fields, where upwards of two hundred cartloads of fuel and more than thirty Guys were brought to be burnt. London was so lit up with bonfires and fireworks that from the suburbs it seemed in one red-heat. Many were the overthrow of horsemen and carriages from the discharge of rockets and the pressure of moving mobs; but this fiery zeal has gradually decreased; men no longer take part in the observance of the day, and boys carry about their Guy with no other thought than how much they will get by the operation to make merry with.

THE MONTH:

SCIENCE AND ARTS.

For some years there have been rumours to the effect that Baron Nordenskiöld, the most successful navigator of modern times, was considering the equipment of an expedition for Antarctic exploration. When the colony of Victoria proposed an expedition of the kind two or three years ago, the enterprise fell through owing to the refusal of the Home Government to provide a ship for the purpose. The idea has now been revived, and Australia will furnish five thousand pounds towards the expense; while a similar amount will be given by Mr Oscar Dickson, who has before been a liberal patron of Baron Nordenskiöld's projects. It will be remembered that the *Challenger* went just within the Antarctic circle, but that it was quite foreign to her mission to undertake exploration work of a geographical character. Sailing-vessels have been the only ships which have really penetrated far towards the South Pole; and it was with such vessels that Captain Cook explored the idea of the existence of a great Antarctic continent. We

may hope that this new expedition, aided by the potent power of steam, and under the command of an intrepid navigator who knows perhaps more about ice-conquest than any other man, will lead to great results. We may also hope that the sum already promised may be greatly increased, so that the efforts of the expedition may not be handicapped by want of funds.

Whenever a serious explosion of fire-damp occurs—and we have unhappily had more than one such fatality within the last few months—the usual stories are current regarding the carelessness of miners in opening their lamps, carrying matches, and in other ways placing in jeopardy their own lives and the lives of their fellows. It is possible that instances of such reckless and criminal conduct may occasionally occur; but it is far more probable that the initial spark which brings about the mischief is due to a far more common cause. Every one knows that when iron strikes stone, sparks are produced; and it is a common thing to see such sparks flying from a horse's hoof as it strikes the hard road. Our forefathers were dependent upon a flint and steel for both light and fire. In a coal-mine, unfortunately, are all the conditions necessary for producing such sparks, for the miner's pick has only to strike a nodule of ironstone and the fire appears. It is quite certain that if gas be present in dangerous quantity, or if the mine be a dusty one, such a spark is quite sufficient to deal death and destruction around. We throw out the suggestion that it would be practicable to substitute for miners' tools some other metal, such as one of the new bronzes, for the iron which strikes sparks so readily.

Mr A. Upward, of Kensington, has invented an apparatus of simple construction which will enable a miner to ascertain whether in working upon the face of the coal he is likely to come upon water or gas. The contrivance consists of a chamber fitted with a slide-valve, which can be held firmly against the face of the coal by means of struts and temporary supports. Through this valve, in which is a stuffing-box, a boring tool is worked for several feet; and should water or gas be tapped, the one or the other will rush into the chamber and will be immediately registered by an attached pressure-gauge. But should the coal be solid and give no sign, the apparatus is removed, and the collier can work with confidence to as great a depth as the boring tool has already penetrated. A modification of the apparatus, in which a larger boring tool is employed, can be used for passing nourishment to miners who may be imprisoned, with a wall of coal between them and their rescuers.

A remarkable instance of the convenience of the electric motor is reported from Chicago. Owing to a boiler explosion at a large printing-office in that city, work had to be suspended, and many employees were thus left idle. This state of things must have continued for some weeks, while new boilers were fitted to the engines, if the happy suggestion had not been made to make use of electricity in lieu of steam. A powerful dynamo-machine was procured and connected with the shafting, while at the same time it was connected by cables with a similar machine outside. By this means work was resumed two days after the accident.

It will be remembered that many months ago M. Pasteur proposed to deal with the rabbit pest in Australia by inoculating a few of the animals with disease virus, and turning these few among their fellows, so that they could infect the rest by their presence. M. Pasteur sent his nephew and another of his assistants to Australia with a view to repeat upon a larger scale the experiments which he had already carried out with success in his laboratory. These gentlemen returned to France a few months later much discouraged with their experience among our colonists. They allege that they were only allowed to try a few experiments, and although the results were of a promising nature, all kinds of impediments were placed in their way. Adjournments and delays took place until M. Pasteur abandoned all hope of being able to succeed in his enterprise. It may be that the prize of twenty thousand pounds which was offered by the Australian Government for the discovery of a successful remedy for the extirpation of the rabbits had something to do with this treatment of a foreigner's representatives.

The Journal of the Chemical Society contains an interesting note, from a foreign source, with reference to the pigment known as Egyptian Blue, which was used by the Romans in the first few centuries of the Christian era, and which is of such a permanent character, resisting as it does both atmospheric and chemical influences, that works executed with it many centuries back still retain their brightness of colour. The pigment is said to have been discovered by Vitruvius, in Alexandria, who made it by mixing fine sand with carbonate of soda, adding copper filings to the mixture, and moulding into balls with water. These lumps were then dried, and heated in clay pots until the blue colour was developed. It is thought that the manufacture of this pigment, which has the advantage of being very cheap as well as good, might be revived with great benefit to the arts.

The Royal Meteorological Society recently held in London their eleventh annual Exhibition of Instruments, and it was devoted almost entirely to apparatus which combines photography with meteorology. Some of the exhibits were of very great interest, notably the camera which is used at Kew and other observatories for taking instantaneous pictures of clouds from different points of view at the same moment. In practice, two cameras are used, one being distant half a mile from the other. An observer is stationed at each, and the two men are in telephonic communication with one another. But the simultaneous exposure of the two cameras is of course under the control of one hand, and this is brought about by an instantaneous shutter upon each lens worked by an electro-magnet, both being on the same circuit. The photographs of clouds so obtained can be accurately measured, and their height above the earth can be determined. Photographs of lightning flashes, showing all sorts of peculiarities, also formed an interesting feature of this Exhibition.

A remarkable story is published in a New York scientific journal concerning the method adopted by a gang of horse-stealers in Arkansas to get rid of their ill-gotten steeds. Owing to a quarrel among the gang, the aid of a surgeon was

requisitioned, and it seems that this gentleman put in an appearance at an inopportune time. He found a horse under the operation of being bleached, that is to say the animal was enveloped in a coat made out of india-rubber garments, and was being treated with sulphur vapour. The operator was a woman, who had adopted this plan of treatment after experiments upon her own hair. It is said that the appliances to carry out the deception were very ingenious. The system was to run a stolen horse into the bleachery, and to change its black or chestnut coat into a tint approaching white; at the same time its tail and mane would be trimmed. Thus disguised, the stolen animal could be ridden past its real owner's door without chance of detection. For the present these nefarious practices have been stopped by the authorities.

A French scientific journal, *La Nature*, publishes two photographs which show very well the different effects produced in volley-firing from using ordinary gunpowder and the newly-invented smokeless powder. In each photograph we see a line of soldiers kneeling on one knee and discharging their weapons; but whereas in the one picture all but the nearest five men are hidden in the cloud of smoke which they have produced, in the other the haze which hangs over the muzzles of the weapons is not sufficiently thick to obscure any of the men.

The discovery of Coal-measures near Dover has naturally caused much excitement in the south of England. Geologists have long been of the opinion that the coal-fields of South Wales, Somersetshire, and Gloucestershire might very possibly represent a continuation of the coal-fields of Belgium and Northern France. And it would seem that the boring near Dover has tapped the valuable mineral at an intermediate point. This is not the first time that an attempt has been made to find coal in the southern counties. In 1872 a boring was undertaken at Battle, near Hastings, and a depth of nearly two thousand feet was reached, when the machinery collapsed, and the works were abandoned. Professor Boyd Dawkins, the eminent geologist, formed one of a committee which undertook this experimental boring, and he it was who, in 1886, persuaded Sir Edward Watkin to make a similar boring at the foot of Shakespeare Cliff, an enterprise which has been just crowned with success. The coal this time has been found at a depth of twelve hundred feet from the surface, and it is described as a bright blazing variety, and of the quality found in the collieries in the Mendip Hills. No one can yet tell whether the coal near Dover exists in sufficient quantities to pay for working it. Should it be as abundant as enthusiasts would have us believe, it will certainly change the face of the country, and will turn a large stretch of land which is now devoted to farming purposes into a manufacturing district. The prospect is not a pleasant one, except from a matter-of-fact commercial point of view.

An interesting Report has been published referring to the experiments which have taken place in the New York State prisons with the electrical apparatus which has been erected there for the purpose of carrying out the death penalty. The Committee which was appointed to deal with this question have been testing the power of the

apparatus on the bodies of living animals. In the case of a horse weighing about one thousand pounds one electrode was placed on the forehead of the animal, while the other was fastened to a hind-leg. When the electric current was passed through the circuit, the animal fell dead instantaneously. In order to settle the question whether this supposed instant death was not a case of suspended animation, a calf was subjected to the effects of the current. Immediately after the apparent death, artificial respiration was kept up for half an hour, but the animal showed no sign of returning life.

The immense deposits of chalk and clay, the one underlying the other, which have been discovered in the county of Grey, Ontario (Canada), are of far-reaching importance, for the two materials are of the kind from which the best Portland cement can be manufactured. Hitherto, this cement has been always imported to the American Continent from Europe, for the American chalk hitherto found was not pure enough to make good cement. These deposits are situated at a short distance from the Grand Trunk Railway of Canada, and are proved by experiment to yield a cement of the very best quality.

A Dynamite Gun is now in course of construction at Birmingham, and this weapon will soon be in the hands of the English Government for exhaustive trial. This gun is the invention of Lieutenant Graydon, late of the United States navy, and its purpose is to throw a shell containing six hundred pounds of dynamite a distance of three miles. We have in recent years had some unpleasant experience as to what very small charges of this explosive are capable of, and can only imagine that no ship afloat could survive the impact of such a missile. The inventor believes that the gun will be convenient in handling, and can be quickly trained and elevated. If it be as successful as he hopes, it will most certainly lead to a revolution in the science of gunnery.

A German paper states that a new form of pipe for the conveyance of water has been introduced. Its core is of glass, over which is a covering of asphalt, in which is imbedded on the outside fine gravel. These pipes are intended to supersede those of iron and lead which at present are universally employed. It is difficult to see how such a fragile substance as glass can be sufficient to withstand the pressure and strain to which water-pipes in roadways are continually subjected; but the new pipes would have a limited application in chemical works and factories for the conveyance of acid and alkaline liquids.

It is said that the largest nickel mine in the world is at Sudbury, in Canada, where the present output is at the rate of four thousand tons per annum. The metal, for which so many uses are now found, occurs at a depth of three hundred feet, and after being raised to the surface, is calcined on the spot, for the purpose of eliminating the sulphur with which it is associated. The metal is next taken to the smelting furnace, and after being robbed of further impurities, assumes the form of an alloy, of which seventy per cent. is nickel and thirty per cent. copper. Much of this alloy finds its way to Swansea (South Wales), where the two metals are separated and refined. A further quantity is shipped to Germany to go through the same processes.

We lately referred in these columns to the value of the Australian Wattle as a substitute for oak-bark in tanning. A correspondent has kindly called our attention to the fact that the Boers of South Africa have for a long time employed the bark of the mimosa, which is also an acacia, for the same purpose. Our readers may be reminded that the mimosa forms a thorny undergrowth, and that it was much used during the war in the Soudan as a defensive hedge for our troops. It seems that every Boer farm possesses a tan-pit of novel construction: it consists of a framework fastened to the top of four posts, from which is hung a bullock's hide. In the receptacle thus formed is placed a quantity of mimosa bark with a sufficiency of water. This is allowed to macerate, when the bark is removed; and the hides, which have been denuded of hair, are placed in the liquor, stones being sometimes employed to keep the skins well immersed therein. In this way an excellent leather is made, and the farmer is dependent upon it for his harness, shoes, and many other articles. The 'tan-pit' is without shelter of any kind, so that when a tropical shower passes over the place the liquor becomes much diluted; but this only results in the tanning process being delayed, and this does not matter, for no one on a Boer farm is ever in a hurry about anything.

A system of fireproof floor construction has recently found favour in New York and has been adopted in many buildings there. It cannot be described as new, for it has been known and practised for many years in other countries, and more particularly in Spain. The flooring is put together upon a light wooden arched framework, which is removed when the work is complete. First, there is placed in position a layer of well-burnt clay tiles, which measure twelve inches in length, six in breadth, and are one inch in thickness; and they are fixed together with a quick-setting cement. This is followed by other layers of the same material, which are set in mortar chiefly composed of Portland cement. This mortar adheres to the tiles with such tenacity that the arch possesses wonderful strength, and when the upper surface is brought to a level by means of concrete, the whole construction is practically monolithic. The system is cheap as well as strong, and the weight per cubic foot is about one hundred pounds.

There are already signs that the cheaper production of the metal aluminium is extending its employment. It is now taking the place of brass for different parts of scientific apparatus, and we notice that besides being used for the mounting of opera and race glasses, it is also coming into use for the fittings of photographic cameras and the mounting of lenses. The saving in weight of a lens so mounted is astonishing, being about seventy per cent. The metal has the appearance of silvery zinc; it does not tarnish, and besides its lightness, is possessed of great tensile strength. For a long time its use was limited, owing not only to its price but to the impossibility of soldering it. This last difficulty, we learn, has now been obviated; and there are rumours that improvements in the method of its manufacture will in time to come make it compete with the cheapest metals for a number of useful purposes.

It is said that the wild buffalo has found a congenial home in the plains of Northern Australia, where it is now to be found in vast herds. These animals are supposed to be the descendants of the first buffaloes which were landed in Australia sixty years ago. In the meantime, the kangaroo, the typical Australian marsupial, is said to be gradually becoming so reduced in numbers that there is a chance of its extinction unless rigorous measures be taken for its preservation. A kangaroo will, it is said, eat as much grass as six sheep, so that from a farmer's point of view its extermination would not be looked upon as an unmixed evil. It is estimated that in the year 1888 there were about thirty per cent. fewer kangaroos in Australia than there were in the previous year.

'THE BAD LANDS' OF DAKOTA.

THERE is a section of territory in the State of South Dakota designated on the maps by the words *Les Mauvaises Terres*, or *The Bad Lands*, which in area covers several hundred square miles. Most of these Bad Lands are quite useless so far as agriculture or stock-raising is concerned, for they are composed of cliffs and canyons where no vegetation grows except the prickly-pear, a species of cactus, and the soap-weed.

Other portions of this section of country are considered to rank the peer of any of the stock-ranges found on our Western plains, and these portions are eagerly sought for by cattle-owners because of the fine quality of the grass, and the shelter afforded to stock in the winter by the deep ravines and canyons. Coal also is found in these Bad Lands; but it has not been discovered either in sufficient quantity or a good enough quality to warrant capitalists in investing. It is of the material found in this section, which furnishes interesting study for the artist, mineralogist, and scientist, we would now write. Here the artist could find landscape studies which would equal those of any of the countries famed for picturesque scenery. Let him approach the Bad Lands as we once did, riding over a level plateau for some miles, with a view in the distance of the white chalky peaks, which had the appearance of a ridge of ordinary sandhills, until you reached the extreme edge of the plateau. There, at the jumping-off place—as it might be very properly called, for the plateau terminated in a precipice several hundred feet deep—stretched out before us a scene which for weirdness and rugged beauty could not be surpassed. Those white peaks, which before had the appearance of a low ridge of sandhills, now arose from the white plain below us to the height of several hundred feet. One might easily imagine himself transported to fairy-land or among the pyramids of Egypt. These white crystallised chalky cliffs lay before us in every conceivable shape: here was a good representation of the ruins of an old feudal castle; there, a peak rose to a point, with its sides as straight and thoroughly proportioned as though built by hand; every peak or cliff appeared in some different and distinct shape from its neighbour; and the noonday sun as it cast its rays on the white crystals of which these peaks were formed, made them flash like diamonds. The scene cannot be described on paper, but transferred

to canvas it would make a picture which would put in the shade the majority of landscape studies.

Riding along a bridle-path or trail used by the Indians, we gained the bottom of the precipice after a descent which to any but an Indian pony or *burro* (donkey) would have been impracticable. Here we find ourselves on the plain from which rise the peaks we have mentioned. The trail we are following winds around the base of many of these fantastically-shaped peaks, and we are enabled to examine the soil, which has the appearance of chalk of a grayish colour, except the crystallised particles, which are almost pure white, and shine and flash in the sunlight. Really, the soil is alkali, and the few streams we cross are so impregnated with this alkali, that the water, even if it were not muddy, is so disagreeable to the taste that a man would rather suffer thirst than drink it. As it flows sluggishly along, it looks more like milk mixed with dirty chalk than water.

A few miles' ride over this trail and among these weird peaks, and again green grass appears before the vision; and almost before we know it, we find ourselves on another plateau; but this is on a level with the plain we have been traversing. Covering an area of several hundred acres is a most luxuriant growth of grass, similar in all respects to the famous blue grass of Kentucky. We also find, what is a great boon after our ride over the alkali plain, a spring of pure ice-cold water. The spot has all the appearance of being specially adapted by nature for a halting-place; but unless a man happened to take the trail we did, he might seek for this spot in this veritable alkali desert for hours and days unsuccessfully; for in every direction, as far as the eye can reach beyond the boundaries of this oasis, are the alkali plains and peaks.

In these Bad Lands the mineralogist and scientist are well rewarded for the labour expended in investigation. Petrifications of every variety are numerous; and some time since, a curiosity-hunter found a petrified ham, perfect in shape, and showing the grain of the meat so naturally that no mistake could be made as to its character. Bones, evidently belonging to animals unknown in this generation, have been found in large quantities; and shells similar to those found on the sea-shore lie scattered around the bases of the peaks in quantities. For this reason, the general belief is that at some time in the past these Bad Lands formed the bed of another ocean. The peculiar formation of the peaks and general appearance of the surrounding country add strength to this belief.

In another section of these Bad Lands we found burning coal-beds, which emit smoke, but no flame. The coal-beds are found in the north-western corner of the Bad Lands, and not in that section we have just attempted to describe. The growth of grass and timber also is excellent in quantity and quality among these coal-beds; and it is no strange sight for the visitor as he rides along to see in the distance what at first sight appears to be the smoke from some hunter's camp-fire, and discover, when he reaches the spot, that the smoke proceeds from some deep narrow canyon, to reach the bottom of which would be an impracticable feat even for an Indian pony.

This section of the Bad Lands, before the cattle ranchmen took possession, and turned their large herds of cattle loose to roam over them at will, abounded plenteously in game such as deer, antelope, and buffalo; but these have been killed off or driven out in the past few years to such an extent that the hunter now has to work hard to find a solitary specimen. Wild-cats and mountain lions, gray and coyote wolves, were also very plentiful; but civilisation has driven them onward. Rattlesnakes appeared to have a great liking for this section of the Bad Lands; but farther to the south-west, where the alkali plains and peaks stretched for so many miles in every direction, animal life of any kind was not found.

It was in the north-western corner of these Bad Lands that the Marquis de Mores, in 1883, located and built a town named Medora after his young wife, the heiress of the Baron von Hoffman, a leading banker of New York city. Here he and his young wife spent the autumn, and enjoyed the hunting, for game was then very plentiful. On the precipitous banks of the Little Missouri, in the very heart of this portion of the Bad Lands, the Marquis erected a large mansion, and attempted to cultivate pleasure-grounds and vegetable garden. The seasons, however, proved too dry; and after a fair trial, it was clearly shown that irrigation was necessary to ensure a crop. The Yellowstone Park, with its famous geysers, possesses no more interesting studies than do these Bad Lands of Dakota.

OCCASIONAL NOTES.

IMPORTANT TO GROWERS OF SUGAR-CANE.

A DISCOVERY of great importance to the growers of sugar-cane has been made. At a recent meeting of the Scientific Committee of the Royal Horticultural Society, Mr D. Morris, Royal Gardens, Kew, exhibited specimens of mature seeds of the common sugar-cane. There were also shown germinating seeds, some plants, drawings of the flower, and dissections of the fruit in detail. He stated that there appeared to be no authentic record of any really wild station for the sugar-cane; further, that the fruit of the sugar-cane was not known before, and had not hitherto been figured or described. At Barbadoes, several times during the last twenty years, and more recently by Professor Harrison and Mr Bovell, self-sown seedlings of the sugar-cane had been observed. The subject was taken up systematically in 1888, and about sixty of the seedlings had been raised to mature canes. Many of these exhibited well-marked characteristics differing from the varieties growing near them. Careful inquiry had shown that canes known as the 'Purple Transparent' and 'White Transparent,' and possibly also the 'Bourbon' cane, produced seeds in very moderate quantities. Spikelets received at Kew had been examined, and the seed found *in situ*. It is anticipated that, by cross fertilisation and a careful selection of seedlings, it will now be possible to raise new and improved varieties of sugar-cane, and renew the constitutional vigour of plants that have become deteriorated through continuous cultivation by cuttings or slips. Great importance is attached to the subject in sugar-producing coun-

tries, as it opens up an entirely new field of investigation in regard to sugar-cane cultivation.

CYCLING AND PHYSIQUE.

In the current number of his quarterly journal, *The Asclepiad*, Dr B. W. Richardson, himself an enthusiastic cyclist, presents an article on Cycling and Physique. He recommends that cycling be delayed by young folks until the body is approaching to its maturity. He admits that cycling tends to induce a certain amount of derangement of the conformation of the framework of the body. Every kind of riding which tends to throw the body forward in a bent or curved position, in a temporary stoop, will in time produce a fixed bend or stoop. The large muscles in the fore-part of the thigh are apt also to receive undue development. On the other hand, he never knew cramp or spasm as a direct result of working the machine; nor sprain, unless in the case of collisions or falls.

Competitive cycling he justly condemns. The proper method of riding is to walk ascents, and always to walk steep ascents, when the healthy condition of body incident to pedestrian exercise is sustained. Dr Richardson's own experience is that for every eight miles of distance traversed in conformity with health, it is wise to do one mile on foot. In a ride of fifty miles in a day, six at least should be done on foot. He utters a warning to those who exhaust their capital stock of vitality by competitive racing; that there is no going back for more capital, no making up, no, not even by rest, for the prime loss from the original capacity. The most and best that can be effected is to keep on, with a measure of the original store of energy dissipated for ever.

AFTER.

If some day in the after-years,
As one weary of the strife,
With nothing left save bitter fears
That mine had been a wasted life—

Should sense of failure bring despair,
And sin's remorse increase the pain,
Without a friend the grief to share,
What joy can then for me remain?

Ah this—that once in summer weather,
Ere yet we dreamed of youth's decline,
We spent one livelong day together,
That I was yours, and you were mine.

EDWARD ROEDNI.

*• TO CONTRIBUTORS.

- 1st. All communications should be addressed to the Editor, 339 High Street, Edinburgh.
 - 2d. For its return in case of ineligibility, postage-stamps should accompany every manuscript.
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